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Snow Surveyors Climbing to a Snow Course

FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

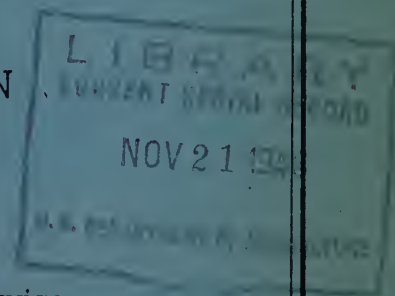
for

RIO GRANDE DRAINAGE BASIN

MAY 1, 1946

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station



Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State and local organizations.

May 1, 1946

WATER SUPPLY OUTLOOK

RIO GRANDE

Water supply outlook from the snow cover on the headwaters of the Rio Grande, Pecos and Canadian and their tributaries is very poor. The general average water content is less than 25 percent of that a year ago. The runoff will be very limited and little if any reservoir filling will be possible during the peak flow. Drought conditions and unseasonable melting temperatures will make the period of maximum runoff from two to three weeks early this year.

RIO GRANDE: Because of the persistent drought conditions prevailing during the past month, there has been no accumulation of water in the snow cover on the headwaters of the Rio Grande. The May 1st snow surveys on ten courses showed an average water content of 2.7 inches, as compared with 11.7 inches at this time a year ago. On this basis there is only 23 percent as much water held in the snow as a year ago. It is approximately one-third of the past 10-year average. At Summitville, elevation 11,500 feet, the water content is 14.5 inches, which is the greatest in any of the areas surveyed. Usually the snow cover at Cumbres Pass approximates that of Summitville, but at this time the water content on the Pass is only 1.8 inches. On the east side of Wolf Creek Pass, the average water content is approximately 11 inches. A year ago it was 37 inches.

Snow surveys were not scheduled as of May 1st on the Red River drainage but it is assumed, in comparison with similar areas in Colorado, that the runoff in Red River this season will be much below normal.

The adverse conditions have made it necessary to make an early call for direct irrigation, especially in the San Luis Valley area, and because of this early start, it is likely that only a very limited amount of water will be available for further reservoir storage this season. Soil moisture conditions throughout the Valley and northern New Mexico are generally poor. However, because of the advanced season, the runoff from snow-melt is occurring early and the streams at this time are well above normal. Despite the subnormal precipitation, it is reported that crop conditions in the irrigated areas appear to be good, with the range fair, but needing moisture to give the grass lands an early start.

There is now stored in the principal reservoirs of the San Luis Valley 43,000 acre-feet. Last year, May 1st, these same reservoirs had in storage 83,000. The combined storage in the Elephant Butte and Caballo reservoirs is 1,164,000 acre-feet. Last year, this storage was 1,430,000.

The general outlook for the coming irrigation water supply in the San Luis Valley, and along the Rio Grande generally, is poor at this time and therefore care should be taken in the most efficient use of the limited water supply that will be available this season. However, because of lack of precipitation during the past months, it is not unlikely that normal or even greater precipitation may be expected during the coming growing season. Reservoir storage in the San Luis Valley area is on the average much less than it was a year ago, and for the principal reservoirs in the Valley the present storage is about 60 percent of the past 10-year average.

RIO CHAMA: There is at this time practically no snow on the headwaters of the Chama and the water supply for this season from the snow-melt is going to be extremely limited. It is not expected that the El Vado Reservoir, which now holds 151,000 acre-feet, will exceed about 75 percent of its capacity, which is 226,000 acre-feet.

RIO PECOS: Snow cover on the headwaters of this stream and its tributaries is practically nil and the outlook for irrigation water supply this coming season along the Pecos is very poor and only because of timely rains during the growing season can there be sufficient water to produce a moderate acreage of irrigated crops. The reservoir storage on the Carlsbad Project is about 8,400 acre-feet as compared with nearly 18,000 a year ago at this time. The soil moisture conditions over the Project lands are poor to fair, and it is reported that the stream flow is now subnormal.

CANADIAN RIVER: On the headwaters of the Canadian River the snow cover is extremely poor, which is identical with that throughout northern New Mexico. It is expected that the runoff from snowcover will not exceed 10 percent of that in a normal year. In the vicinity of Tucumcari soil conditions are poor because of subnormal precipitation during the past month. Stream flow is reported to be below normal. However, crop and range conditions are fair. Storage in Conchas Reservoir is approximately 334,000 acre-feet as compared with 341,000 a year ago. It is not expected that there will be a water shortage for the lands under the Tucumcari Project because of the very substantial reservoir storage serving this area.

GROUND WATER

There has been a general depression of the water table throughout the irrigated sections in the San Luis Valley in Colorado. The lowering of the water table has probably averaged about 1 foot and in many places pumps are in operation to supplement the limited supplies from the streams. Ground-water levels in the lower Rio Grande Valley are normal as there has been no curtailment of irrigation in the area below the Elephant Butte Reservoir.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE BASIN

May 1, 1946

P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation April	Departure from Normal
Canadian	New Mexico	Inches	Inches	Inches	Inches
Rio Grande	Colorado	3.04	-2.28	0.66	-0.66
Rio Grande (N)	New Mexico	5.85	-1.66	1.53	+0.25
Rio Grande (S)	New Mexico	4.79	-2.95	0.62	-0.62
Pecos	New Mexico	2.78	-1.57	0.36	-0.21
		3.60	-1.51	0.20	-0.70

Precipitation was generally below normal during April in New Mexico and the San Luis Valley in Colorado. The same is true for the accumulated precipitation since October 1. A serious deficiency in precipitation exists throughout the entire Rio Grande drainage basin.

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS
YEARS BY WATERSHEDS

WATERSHED	Snow Depth			Water Content			Number Courses in		Snow Density		1946 Water Content in percent of	
	Ten Year Avg. *	1945	1946	Ten Year Avg. *	1945	1946	Average		Ten Year Avg. *	1945	Ten Year Avg. *	1945
	In.	In.	In.	In.	In.	In.	Percent	Percent	Percent	Percent	Percent	Percent
Rio Grande	23.4	30.1	7.6	9.2	11.7	2.7	10	39	39	36	29	23
Chama River	---	---	---	---	---	---	---	---	---	---	---	---
Pecos River	---	---	---	---	---	---	---	---	---	---	---	---
Canadian River	---	---	---	---	---	---	---	---	---	---	---	---

*Some for shorter periods.

RIO GRANDE WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued May 10, 1946, at Fort Collins, Colorado

No.	Main Drainage and Course	Local Drainage	State	Location		Description	Elev.	National Forest	May 1 Snow Cover Measurements			
				Locality					Av. Snow Depth		Av. Water Content	
									1945	1946	1945	1946
RIO GRANDE												
26	Wolf Creek Pass	South Fork	Colo.	Wolf Cr. Pass	4-37N-2E	10000	Rio Grande	67.4	In.	In.	In.	
27	Upper Rio Grande	Rio Grande	"	Rio Grande Res.	13-40N-4W	9350	"	6.5	79.1	25.7	37.0	
47	Silver Lakes	Alamosa R.	"	1mi. S. Silver L.	15-36N-5E	9600	"	3.5	0.0	0.0	0.0	
49	River Springs	Conejos R.	"	10mi. W. Mogote	25-33N-6E	9300	"	4.1	0.0	0.0	0.0	
74	La Veta Pass #2	SanCristo Cr.	"	La Veta Pass	22-28S-70W	9300	SanCristo Gr	11.5	9.8	0.0	3.2	
76	Summitville	Wightman Cr.	"	Summitville	30-37N-4E	11500	Rio Grande	65.8	22.3	0.0	8.7	
77	Cumbres Pass #2	Los Pinos R.	"	Cumbres Pass	17-32N-5E	10000	"	43.8	73.1	45.3	23.5	
80	Santa Maria	N. Clear Cr.	"	Santa Maria Res.	8-41N-2W	9700	"	4.5	79.7	5.3	31.3	
82	Culebra	Culebra R.	"	12mi. E. San Luis	37.2N-105.2W	10000	SanCristo Gr	28.9	0.0	0.0	0.0	
84	Fort Garland	Big Ute Cr.	"	6mi. N. Ft. Garland	13-29N-72W	8200	"	4.7	36.8	0.0	13.1	
									0.0	0.0	0.0	
CANADIAN												
1	Red River	Red River	N. Mex.	6mi. SE. Red River	29-23N-15E	9500	Carson					
2	Taos Canyon	Rio de Taos	"	14mi. E. Taos	10-25N-15E	9000	"					
4	Aspen Grove	Rio En Medio	"	10mi. NE. Santa Fe	12-18N-10E	9100	Santa Fe					
5	Lee Ranch	Jemez Cr.	"	5mi. NW. Bland	3-13N-4E	9050	"					
6	Canjilon	Canjilon Cr.	"	8mi. NE. Canjilon	4-26N-6E	9500	Carson					
9	Hematite Park*	Red River	"	3mi. SE. Red R.	8-28N-15E	9500	"					
12	Tres Ritos	Agua Piedra	"	7mi. W. Holman	23-22N-13E	9000	"					
15	Pay Role	Rock Creek	"	4mi. SE. Hopewell	16-28N-7E	10000	"					
16	Jicarilla	Rock Lake Cr.	"	15mi. S. Dulce	9-29N-1W	8500	Jicarilla R					
17	Chama Divide	Willow Creek	"	6mi. W. Chama	36.9N-106.7W	7750	Off Forest					
18	Chamita	Chamita Cr.	"	6mi. NW. Chama	36.9N-106.7W	8500	"					
19	Big Tesuque	Big Tesuque Cr.	"	10mi. NE. Santa Fe	17-18N-11E	10000	Santa Fe					
20	Panchuela #2	Panchuela Cr.	"	1mi. N. Cowles	34-19N-12E	8500	Santa Fe					
								23.4	30.1	7.6	11.7	
CANADIAN												
9	Hematite Park	Moreno Cr.	N. Mex.	3mi. SE. Red R.	8-28N-15E	9500	Carson					
10	Ocate Mesa	Ocate Creek	"	3mi. E. Black L.	25-24N-16E	9200	Off Forest					

*On adjacent drainage

Average for period of record

RESERVOIR STORAGE

Reservoir Storage in Thousands of Acres-Feet, Rio Grande Drainage, as of May 1, for the Years 1937-1946, inclusive. (Based on data from the State Engineer of Colorado, U. S. Bureau of Reclamation and other agencies.)

A = Percentage of capacity. B = Percentage of 10-year average. C = Percentage of filling forecast for 1946.

Reservoir	Capac- ity Ac-ft.	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	10-yr. Avg.*		A	B	C
		Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	%	%	%
RIO GRANDE DRAINAGE																
Rio Grande	45.8	16.2	17.5	36.7	4.7	8.4	49.1	7.8	13.1	22.3	1.9	17.5	4	11	20	
Santa Maria	45.0	9.5	10.8	15.1	3.8	4.6	26.9	15.4	6.3	16.7	6.7	11.6	15	58	30	
Sanchez	103.2	17.6	19.2	22.9	10.9	8.6	37.9	35.0	16.6	12.1	9.1	19.0	9	48	25	
Terrace	17.7	4.5	9.6	7.5	1.7	3.8	9.1	1.3	5.1	3.8	2.4	4.9	14	49	30	
Continental	26.7	0.5	4.0	4.3	1.0	0.0	10.0	16.2	8.2	19.5	15.1	7.9	57	191	75	
Elephant																
Butte	2273.7	917.1	1099.0	1324.0	503.2	598.5	2126.0	1653.1	1140.4	1212.9	964.7	1183.9	42	82	50	
Caballo	365.0	0.0	14.5	44.5	17.3	67.8	263.1	238.3	195.7	217.4	199.5	125.8	55	159	--	
El Vado	226.0	--	145.6	87.4	113.7	129.8	155.5	127.0	72.3	140.0	151.1	125.0	67	120	75	
CANADIAN DRAINAGE																
Conchas	600.0	--	--	--	80.6	155.5	390.6	390.3	397.0	341.2	333.5	298.4	56	112	60	
PECOS DRAINAGE																
Alamogordo	148.0	--	11.2	95.6	50.2	41.4	129.8	89.4	25.5	7.0 [Ⓢ]	4.4	50.5	3	9	10	
McMillan	32.3	13.3	6.7	14.7	9.8	35.9	30.8	20.3	11.0	8.6	0.0	15.1	0	0	0	
Avalon	7.0	1.9	1.8	3.0	0.8	4.7	5.1	0.8	1.1	2.4	4.0	2.6	57	154	60	

*Some averages for shorter periods

ⓈUnavailable storage

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Mississippi-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE

- Colorado State Engineer
- Wyoming State Engineer
- Utah State Engineer
- New Mexico State Engineer
- Montana State Engineer
- Nebraska State Engineer
- Colorado Experiment Station
- Colorado Extension Service
- Montana Experiment Station
- Utah Experiment Station

FEDERAL

- Department of Agriculture
 - Forest Service
 - Soil Conservation Service
- Department of Interior
 - Bureau of Reclamation
 - Indian Service
 - Geological Survey
 - National Park Service
- Department of Commerce
 - Weather Bureau
- War Department
 - Army Engineer Corps

PUBLIC UTILITIES

- Colorado Public Service Company
- Western Colorado Power Company
- Montana Power Company
- Denver and Rio Grande Western R. R. Company

MUNICIPALITIES

- City of Bozeman
- City of Denver
- City of Boulder

WATER USERS ORGANIZATIONS

- Poudre Valley Water Users' Association
- Arkansas Valley Ditch Association
- Colorado River Water Conservation District

IRRIGATION PROJECTS

- Farmers Reservoir and Irrigation Company
- San Luis Valley Irrigation District
- Santa Maria Reservoir Company
- Costilla Land Company
- Uncompahgre Valley Water Users' Association
- Wyoming Development Company
- Goshen Irrigation District
- Kendrick Project
- Pathfinder Irrigation District
- Salt River Valley Water Users' Association
- San Carlos Irrigation and Drainage District

Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

